CRUISE REPORT

Southeast Fishery-Independent Survey (SEFIS)

R/V *Savannah* Cruise SH-11-25
16 – 24 August, 2011
Total Number of Sea Days - 9

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
Beaufort Laboratory
101 Pivers Island Rd.
Beaufort, NC 28516

108 camera-trap deployments
3 hook and line deployments
16 CTD casts

INTRODUCTION

The R/V *Savannah* departed Savannah, GA, on 16 August 2011 with scientists from the Southeast Fishery-Independent Survey (SEFIS) to sample in continental shelf and shelf-break waters off the southeastern US. SEFIS was created by the National Marine Fisheries Service in 2010 and is run out of the Beaufort Laboratory. This survey conducts applied fishery-independent sampling and related research focusing on the assessment of spatial variability in distribution and abundance of red snapper and other reef species within the snapper-grouper complex, via data collected from fish traps, video cameras, and acoustics. During this survey, chevron trap catches and associated underwater video recordings were collected from randomly selected stations on known hardbottom habitats between 30.37 N and 31.74 N. A total of 108 stations were sampled with camera-trap gear over 9 sea days between 19 and 76 meter depths. The cruise was cut short by two days due to the fast-approaching Hurricane Irene.

OBJECTIVES

1. Increase the spatial footprint and sample size of fishery-independent sampling in US southeast waters. Baited chevron traps, most of which had one or more mounted high-definition video cameras, were utilized for hardbottom reef fish community assessments and collection of reef fish for biological samples (i.e., otoliths and gonads).

2. Use video cameras on chevron traps to address trap selectivity issues, locate and describe hardbottom habitats, and provide an additional index of abundance for stock assessments.

3. Use a CTD instrument package to collect environmental data (temperature, salinity, dissolved oxygen, and turbidity) at camera-trap sampling locations.

METHODS

Camera-Trap Sampling

Camera-trap gear consisted of two high definition video cameras mounted to a chevron fish trap. Chevron traps were constructed out of plastic-coated wire mesh. A Canon camera (model HF S200) was attached above the mouth of the trap, and a GoPro camera (model HD Hero) was attached above the nose of the trap (Figure 1). Traps were baited with Atlantic menhaden, *Brevoortia tyrannus*, and video cameras were set to record before deployment. Camera-traps were deployed at randomly selected stations at least 200 meters apart on suspected or known hardbottom habitats, and left to soak for approximately 90 minutes. Camera-traps were most often deployed in sets of six. A CTD cast (see environmental data collection) was conducted during the 90-minute soak time for each trap set. Fish catches were processed after trap retrieval. All fish were counted, weighed, and measured to the nearest millimeter. Individuals of select species (e.g., species in the snapper-grouper complex) were further processed for additional lengths and biological samples (otoliths, gonads, and DNA). Video files were downloaded and backed up on media storage devices. Biological samples and video files were brought to the Beaufort laboratory for further processing and analysis.

Hook and Line Sampling
Hook and line fishing was conducted to gather stomach samples for analysis and to supplement age/growth samples. A variety of reel, line, and hook sizes were used, typically with 3 hooks baited with a mixture of cut squid and cigar minnow. Targeted species for stomach content analysis were vermilion snapper, gray triggerfish, and red porgy. Fish collected with hook and line gear were counted, weighed, measured, and processed for biological samples (gonads, otoliths, and stomachs. Each successful fishing event (all anglers grouped together) was assigned a collection number.

Environmental Data Collection
Environmental data were collected with a Seabird "Conductivity, Temperature and Depth" instrument package (CTD; model SBE 25) and Scientific Computer System software (SCS). CTD casts were conducted near the middle of each camera-trap soak period; instruments were lowered to within 2 meters of the bottom. Numerous water profile measurements were collected, including temperature (◦C), salinity (parts per thousand), dissolved oxygen (mg/L), and turbidity (% transmission). CTD data were archived for further processing at the Beaufort laboratory.
SCS software (version 4.2.3) was used to collect specific information for each fishing and CTD event, including soak time/cast duration as well as start and end latitude, longitude, and depth (m).

SURVEY RESULTS

Camera-Trap Sampling
108 stations were sampled with camera-trap gear (Table 1, Figure 2). From these traps, 27 taxa were collected and worked up for length frequency data.

Hook and Line Sampling
3 additional stations were sampled with hook and line gear. From these collections, 5 taxa were worked up for length frequency data and further processed for otoliths, gonads, and stomach tissues.

Environmental Data Collection
16 CTD casts were conducted during the cruise (Table 1, Figure 2). CTD data will be processed back at the lab using Seabird SBE Data Processing software (version 7.2), and archived in a database at the NMFS–Beaufort Laboratory for future analysis.

Table 1. Summary of station coordinates, depth, date and time for each fishing event (camera-trap Gear=324, hook and line Gear = 014) and CTD cast (Gear=298) conducted on the SH-11-25 survey. Values highlighted in yellow estimated. Times were recorded in Coordinated Universal Time (UTC).

Collection Number	Gear	Date	Time (UTC)	Latitude	Longitude	Depth (m)
113399	324	08/17/2011	12:01:22	31.10	-79.93	53
113400	324	08/17/2011	12:13:00	31.11	-79.92	55
113401	324	08/17/2011	12:22:59	31.11	-79.93	51
113402	324	08/17/2011	12:33:58	31.12	-79.92	53
113403	324	08/17/2011	12:45:00	31.12	-79.92	53
113404	324	08/17/2011	12:54:29	31.13	-79.92	49
113405	298	08/17/2011	13:10:59	31.10	-79.93	52
113406	324	08/17/2011	15:19:47	31.13	-79.92	52
113407	324	08/17/2011	15:27:27	31.13	-79.92	53
113408	324	08/17/2011	15:36:06	31.14	-79.91	53
113409	324	08/17/2011	15:47:06	31.15	-79.91	52
113410	324	08/17/2011	15:54:31	31.15	-79.91	53
113411	324	08/17/2011	16:02:19	31.16	-79.91	49
113412	298	08/17/2011	16:20:02	31.13	-79.92	53
113413	324	08/17/2011	19:54:30	31.05	-80.04	49
113414	324	08/17/2011	20:07:14	31.05	-80.04	49
113415	324	08/17/2011	20:18:06	31.06	-80.03	50
113416	324	08/17/2011	20:24:12	31.06	-80.04	50
113417	324	08/17/2011	20:32:11	31.07	-80.03	50
113418	324	08/17/2011	20:40:53	31.07	-80.03	50
113419	298	08/17/2011	20:50:41	31.07	-80.03	50
113420	324	08/18/2011	11:56:05	30.37	-80.22	58
113421	324	08/18/2011	12:04:08	30.38	-80.22	57
113422	324	08/18/2011	12:11:56	30.38	-80.22	56
113423	324	08/18/2011	12:21:53	30.39	-80.22	56
113424	324	08/18/2011	12:36:27	30.39	-80.22	55
113425	324	08/18/2011	12:43:59	30.40	-80.22	55
113426	298	08/18/2011	13:07:04	30.37	-80.22	64
113427	324	08/18/2011	15:10:51	30.40	-80.22	55
113428	324	08/18/2011	15:19:16	30.41	-80.21	56
113429	324	08/18/2011	15:32:15	30.42	-80.21	55
113430	324	08/18/2011	15:42:34	30.43	-80.21	55
113431	324	08/18/2011	15:52:37	30.44	-80.21	55
113432	324	08/18/2011	16:01:58	30.44	-80.21	54
113433	324	08/18/2011	18:49:30	30.44	-80.21	53
113434	324	08/18/2011	19:00:02	30.45	-80.20	59

Collection Number	Gear	Date	Time (UTC)	Latitude	Longitude	Depth (m)
113435	324	08/18/2011	19:10:02	30.46	-80.20	53
113436	324	08/18/2011	19:22:23	30.47	-80.20	52
113437	324	08/18/2011	19:31:23	30.47	-80.20	53
113438	324	08/18/2011	19:39:59	30.48	-80.20	53
113439	298	08/18/2011	20:01:55	30.44	-80.20	66
113440	324	08/19/2011	12:02:25	30.63	-80.21	45
113441	324	08/19/2011	12:09:33	30.63	-80.21	43
113442	324	08/19/2011	12:15:51	30.64	-80.21	44
113443	324	08/19/2011	12:21:50	30.64	-80.21	42
113444	324	08/19/2011	12:27:39	30.64	-80.21	43
113445	324	08/19/2011	12:34:17	30.65	-80.21	43
113446	298	08/19/2011	12:49:08	30.63	-80.21	46
113447	324	08/19/2011	15:10:00	30.57	-80.16	54
113448	324	08/19/2011	15:17:01	30.57	-80.16	51
113449	324	08/19/2011	15:26:24	30.58	-80.16	51
113450	324	08/19/2011	15:32:25	30.58	-80.16	51
113451	324	08/19/2011	15:41:09	30.59	-80.16	54
113452	324	08/19/2011	15:48:48	30.59	-80.15	58
113453	298	08/19/2011	16:18:48	30.56	-80.16	66
113454	324	08/19/2011	19:22:41	30.74	-80.22	44
113455	324	08/19/2011	19:36:33	30.75	-80.21	45
113456	324	08/19/2011	19:43:38	30.75	-80.22	43
113457	324	08/19/2011	19:53:01	30.76	-80.22	43
113458	298	08/19/2011	21:50:29	30.76	-80.22	44
113459	324	08/20/2011	11:58:21	31.24	-79.88	50
113460	324	08/20/2011	12:06:14	31.25	-79.88	50
113461	324	08/20/2011	12:13:19	31.25	-79.88	48
113462	324	08/20/2011	12:22:04	31.25	-79.88	51
113463	324	08/20/2011	12:32:48	31.26	-79.87	54
113464	324	08/20/2011	12:42:16	31.27	-79.87	53
113465	298	08/20/2011	12:59:59	31.24	-79.88	53
113466	014	08/20/2011	01:39:10	30.76	-80.22	43
113467	324	08/20/2011	15:11:07	31.27	-79.87	50
113468	324	08/20/2011	15:18:32	31.28	-79.87	51
113469	324	08/20/2011	15:28:34	31.28	-79.87	51
113470	324	08/20/2011	15:37:50	31.29	-79.86	54
113471	324	08/20/2011	15:44:32	31.29	-79.86	52
113472	324	08/20/2011	15:53:00	31.30	-79.86	56
113473	324	08/20/2011	19:16:44	31.22	-79.89	49
113474	324	08/20/2011	19:25:15	31.22	-79.89	50
113475	324	08/20/2011	19:35:21	31.23	-79.89	50

Collection Number	Gear	Date	Time (UTC)	Latitude	Longitude	Depth (m)
113476	324	08/20/2011	19:44:41	31.23	-79.89	48
113477	298	08/20/2011	20:03:58	31.21	-79.89	54
113478	324	08/21/2011	12:11:53	30.61	-81.18	21
113479	324	08/21/2011	12:18:37	30.61	-81.17	21
113480	324	08/21/2011	12:29:18	30.62	-81.17	21
113481	324	08/21/2011	12:34:29	30.62	-81.18	21
113482	324	08/21/2011	12:37:57	30.62	-81.18	23
113483	324	08/21/2011	12:49:08	30.62	-81.18	22
113484	298	08/21/2011	13:05:39	30.61	-81.18	21
113485	014	08/20/2011	20:05:00	31.20	-79.90	
113486	324	08/21/2011	18:00:51	30.49	-81.22	20
113487	324	08/21/2011	18:03:25	30.49	-81.22	20
113488	324	08/21/2011	18:08:29	30.49	-81.21	21
113489	324	08/21/2011	18:17:17	30.49	-81.21	20
113490	324	08/21/2011	18:21:07	30.49	-81.22	21
113491	324	08/21/2011	18:28:32	30.48	-81.22	20
113492	298	08/21/2011	18:47:07	30.49	-81.23	19
113493	324	08/22/2011	12:19:24	31.53	-79.75	57
113494	324	08/22/2011	12:30:28	31.53	-79.74	59
113495	324	08/22/2011	12:39:47	31.53	-79.74	58
113496	324	08/22/2011	12:51:38	31.54	-79.74	60
113497	324	08/22/2011	13:01:54	31.54	-79.74	60
113498	324	08/22/2011	13:09:38	31.54	-79.75	60
113499	298	08/22/2011	13:24:18	31.52	-79.75	61
113500	324	08/22/2011	15:47:31	31.55	-79.71	70
113501	324	08/22/2011	15:58:15	31.55	-79.73	64
113502	324	08/22/2011	16:26:26	31.54	-79.73	60
113503	324	08/22/2011	16:38:21	31.54	-79.73	61
113504	324	08/22/2011	19:34:46	31.62	-79.66	74
113505	324	08/22/2011	19:43:37	31.62	-79.67	70
113506	324	08/22/2011	19:52:36	31.62	-79.67	70
113507	324	08/22/2011	20:04:15	31.61	-79.67	73
113508	324	08/22/2011	20:15:19	31.61	-79.68	68
113509	324	08/22/2011	20:21:26	31.61	-79.67	71
113510	298	08/22/2011	20:42:09	31.62	-79.65	76
113511	324	08/23/2011	12:32:24	31.63	-79.65	75
113512	324	08/23/2011	12:40:28	31.63	-79.66	73
113513	324	08/23/2011	12:46:20	31.63	-79.66	71
113514	324	08/23/2011	12:55:59	31.63	-79.67	68
113515	324	08/23/2011	13:04:51	31.64	-79.67	66
113516	324	08/23/2011	13:11:19	31.64	-79.66	67

Collection Number	Gear	Date	Time (UTC)	Latitude	Longitude	Depth (m)
113517	298	08/23/2011	13:25:57	31.64	-79.65	75
113518	014	08/22/2011	23:10:27	31.62	-79.67	70
113519	324	08/23/2011	18:55:28	31.74	-80.21	34
113520	324	08/23/2011	19:07:02	31.74	-80.22	33
113521	324	08/23/2011	19:15:18	31.74	-80.22	32
113522	324	08/23/2011	19:24:28	31.74	-80.23	34
113523	324	08/23/2011	19:30:26	31.73	-80.23	34
113524	324	08/23/2011	19:51:38	31.74	-80.18	31
113525	298	08/23/2011	21:41:41	31.74	-80.17	31

Figure 1. Chevron trap with video cameras attached over the nose and mouth positions.

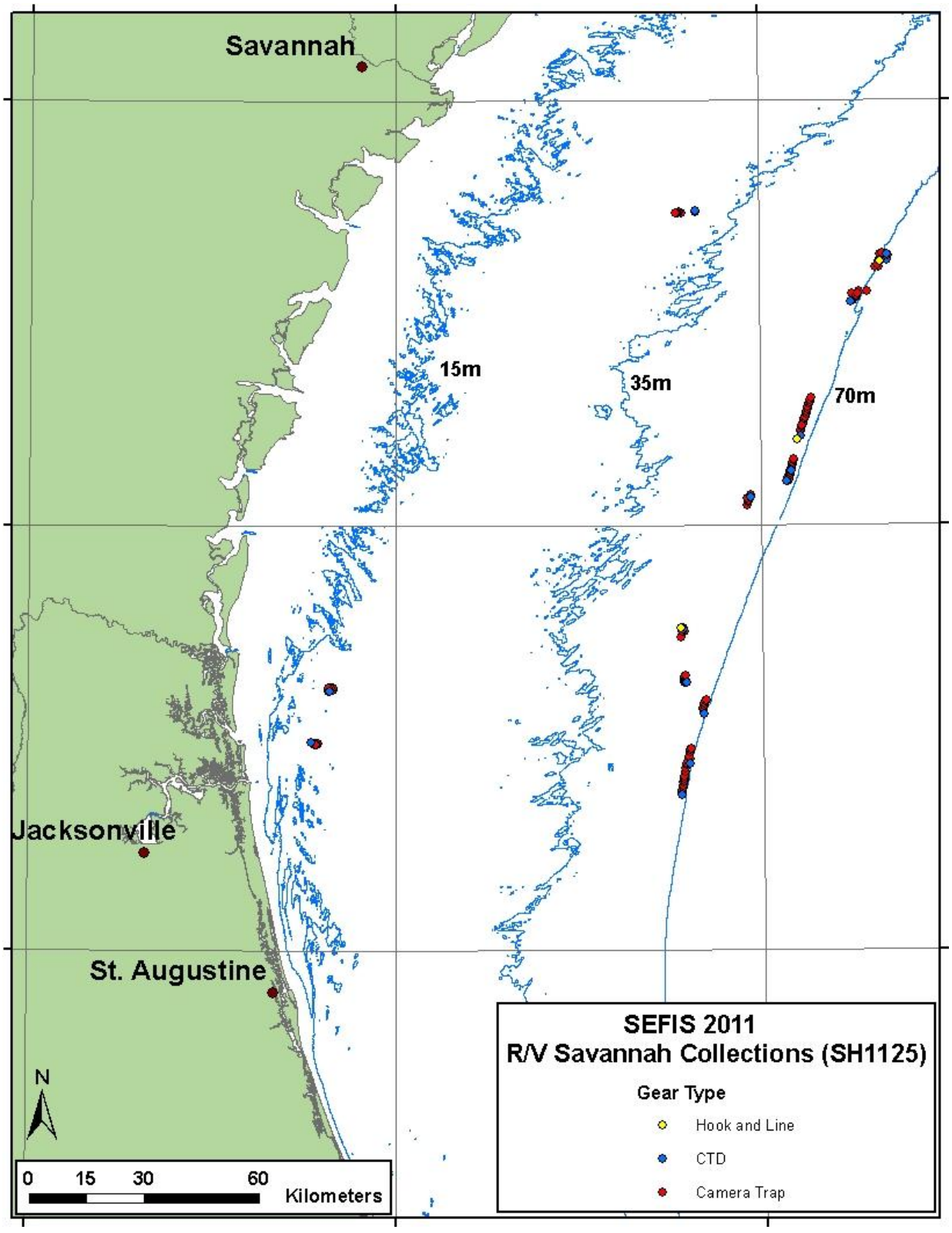

Figure 2. Locations of stations sampled with camera-trap, hook and line, and CTD gear on the SH-11-25 survey. Note that symbols overlap in many cases.

Cruise Report Prepared by: Warren Mitchell, Nate Bacheler, and Christina Schobernd

Note that the use of trade, product, industry, or firm names, products, software, or models, whether commercially available or not, is for informative purposes only and does not constitute an endorsement by the U.S. Government or the National Oceanic and Atmospheric Administration.